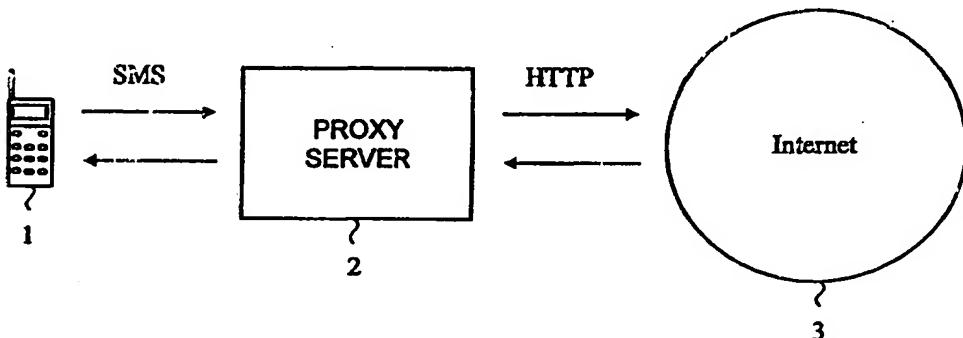




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(54) Title: METHOD AND SYSTEM FOR THE BROWSING OF HYPERTEXT PAGES



(57) Abstract

The present invention relates to a method and system for the browsing of hypertext pages by means of a mobile station in a telecommunication system, said system comprising a mobile station (1), conversion means (2) and a telecommunication network (3). The invention makes it possible to browse WWW pages and follow hyperlinks on the display of an ordinary mobile station. The invention is particularly well suited for mobile stations supporting the Smart Messaging definition.

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METHOD AND SYSTEM FOR THE BROWSING OF HYPERTEXT PAGES

The present invention relates to telecommunication. In particular, the invention relates to an advanced method for the browsing of hypertext pages using a mobile station.

With the development of the World Wide Web (WWW), the Internet has become one of the fastest growing telecommunication segments. In the near future, increasing integration of the WWW and digital mobile communication systems is to be expected, which means that WWW pages can be browsed and various services associated with them can be used e.g. by means of a GSM telephone. The problem so far has been that in most cases WWW pages have been designed to be used via a graphic user interface and using e.g. a mouse, whereas a typical mobile station has a very limited text-based display with a keypad user interface. Therefore, displaying e.g. hyperlinks and following them is very difficult. One solution to this problem is the Nokia Communicator mobile station, which, in addition to normal mobile station properties, contains a small computer system with a graphic user interface. However, adding a computer system makes the device too expensive, which again makes it unavailable to the average user. A Nokia product called Artus NetGate again allows the user to search information on WWW pages by entering search words via an ordinary mobile station. However, this involves the problem that WWW pages cannot be freely browsed. It is only possible to search pages predetermined by the operator.

The object of the present invention is to disclose a new type of method to eliminate the drawbacks described above.

A specific object of the present invention is to disclose a method and system which make it possible

to browse WWW pages and move from page to page by following hyperlinks using an ordinary mobile station.

As for the features characteristic of the invention, reference is made to the claims.

5 In the method of the invention for browsing hypertext pages using a mobile station in a telecommunication system comprising a telecommunication network, such as the Internet, conversion means, such as a proxy-type server, and which telecommunication system
10 comprises a mobile station that preferably supports the Smart Messaging definition, and/or which mobile station preferably comprises soft keys, when a hypertext page or a hyperlink is selected via the mobile station, the selection is transmitted to the conversion means. Next,
15 using the conversion means, the hypertext page corresponding to the selection is fetched from the telecommunication network. Further using the conversion means, the page is converted into a form that allows it to be presented on the display of the mobile station. The
20 converted page is transmitted to the mobile station and presented on the display of the mobile station. According to the invention, hyperlinks present in the retrieved hypertext page are identified using the conversion means. Further, according to the invention, using
25 the conversion means, information regarding the retrieved hypertext pages and the hyperlinks contained in them is saved. The information to be saved comprises e.g. the URL-format addresses of the pages/links (Uniform Resource Locator, URL). Further, according to the
30 invention, the hyperlinks contained in the hypertext page to be transmitted to the mobile station and the rest of the contents of the page are transmitted to the mobile station separately from each other.

35 In an embodiment of the invention, the links contained in the page to be transmitted to the mobile station are sent as a form comprising descriptions of the links e.g. in a menu format as well as link-

specific identification data, such as e.g. a code by which the conversion means can find the link corresponding to the description and its URL address in the information saved. The rest of the contents of the hypertext page except the links is transmitted to the mobile station in the form of a SMS, USSD or corresponding message (Short-Message Service Centre, SMS; Unstructured Supplementary Service Data, USSD). If the contents exceed the maximum message length, the text will be divided into parts and sent in several messages.

In an embodiment of the invention, a hypertext page is selected for presentation by sending from the mobile station to the conversion means a form comprising identification data, such as e.g. the URL-format address of the page, identifying the selected hypertext page. To follow a hyperlink, the link is selected in a menu, whereupon a form comprising user-specific identification information as to which page is wanted and which link is to be followed is sent to the conversion means.

In an embodiment of the invention, hyperlinks are displayed and/or selected using soft keys. Soft keys are general-purpose keys used in certain mobile station models for purposes varying according to the situation. For instance, a menu containing hyperlinks can be displayed by pressing a predetermined soft key, and a link in the menu can be selected with a soft key.

In an embodiment of the invention, the form is a TTML form, a WML form or equivalent (Tagged Text Markup Language, TTML; Wireless Markup Language, WML).

In an embodiment of the invention, the hypertext page to be retrieved from the telecommunication network is a WWW page.

In an embodiment of the invention, the mobile station is based on digital mobile communication tech-

nology, such as the GSM, DCS1800 or equivalent technology.

As compared with prior art, the invention provides the advantage that it makes it possible to browse 5 WWW pages and follow hyperlinks on the limited display of an ordinary mobile station. The user is not required to know the exact location of the data for each link, such as the URL address, but the user can find the desired information by "surfing". The invention is especially well suited for use in mobile stations supporting 10 the Smart Messaging definition. No accessories such as joystick or trackball type devices need to be added to mobile stations to make it easier to follow the links, but links can be easily and flexibly followed 15 using existing mobile stations with only a keypad user interface.

In the following, the invention will be described by the aid of a few examples of its embodiments by referring to the attached drawing, wherein

20 Fig. 1 presents an embodiment of the method of the invention in the form of a flow diagram; and

Fig. 2 presents an embodiment of the system of the invention in the form of a flow diagram.

25 Fig. 1 presents a flow diagram representing an embodiment of the procedure of the invention as an example. The user's GSM telephone contains a certain type of TTML form with an input field, in which the user enters the URL address of the desired WWW page. The form is sent to a server, which gets the required WWW page 30 from the Internet. The server identifies the hyperlinks on the page and saves appropriate page information, such as the URL addresses and the links in the page. In addition, the server converts the page into a form allowing it to be presented on the display of a GSM telephone. At this stage, e.g. graphics included in the 35 page are removed as they cannot be reproduced on a telephone display. The contents of the page excluding

the links are sent to the user in the form of a normal short message. If the text of the page exceeds the maximum length of a short message, then it is divided into parts and sent in several short messages. The user 5 reads the text. After that, a TTML form containing the links for the page just read/browsed by the user is sent to the GSM telephone. This form contains a menu with descriptions of the links. The form does not contain the URL addresses of the links but only codes that 10 the server can use to find the appropriate link and its URL address in the information it has saved. The user can follow a desired link by selecting the link in the menu and sending the form back to the server. The form sent back contains user-specific identification data 15 indicating the WWW page concerned and the link to be followed.

Fig. 2 presents a flow diagram representing an embodiment of the system of the invention as an example. Using a GSM telephone 1, a desired WWW page is selected. The selection is transmitted to a proxy-type 20 server 2, which gets the page from the Internet 3 and delivers it in a converted form to the GSM telephone. The server and the Internet communicate using the HTTP protocol (HyperText Transfer Protocol, HTTP). The 25 server and the GSM telephone communicate using SMS messages and TTML forms.

The present application is based on Finnish application FI 980484, which has been filed on 3.3.1998 and whose contents are included here by this reference.

30 The invention is not restricted to the examples of its embodiments described above, but many variations are possible within the scope of the inventive idea defined by the claims.

CLAIMS

1. Method for the browsing of hypertext pages by using a mobile station, in which method, to select a
5 hypertext page or hyperlink from the mobile station, a selection is transmitted from the mobile station, the hypertext page corresponding to the selection is retrieved from a telecommunication network, the page is converted into a form allowing it to be presented via
10 the mobile station, the page is transmitted to the mobile station and presented on the display of the mobile station; characterised in that
 - the hyperlinks present in the hypertext page to be transmitted to the mobile station are identified;
 - 15 - information regarding the hypertext page and the hyperlinks contained in it is saved;
 - the hyperlinks and the rest of the contents of the hypertext page are transmitted to the mobile station separately.
- 20 2. Method as defined in claim 1, characterised in that
 - the hyperlinks are transmitted to the mobile station as a form comprising descriptions of the links and link-specific identification data;
 - 25 - the rest of the contents of the hypertext page excluding the hyperlinks is transmitted to the mobile station in the form of a SMS, USSD or corresponding message.
- 30 3. Method as defined in claim 1 or 2, characterised in that
 - the selection of a hypertext page is transmitted as a form comprising identification data for the hypertext page selected; and
 - the hyperlink selection is transmitted as a
35 form comprising identification data for the hyperlink selected.

4. Method as defined in any one of claims 1 - 3, characterised in that hyperlinks are displayed and/or selected by utilising the soft keys of the mobile station.

5 5. Method as defined in any one of claims 1 - 4, characterised in that the form is a TTML form, a WML form or equivalent.

6. Method as defined in any one of claims 1 - 5, characterised in that the hypertext page 10 is a WWW page.

7. Method as defined in any one of claims 1 - 6, characterised in that the mobile station is a digital mobile station.

8. System for the browsing of hypertext pages 15 by using a mobile station, said system comprising a mobile station (1), which is used to select and present a hypertext page or hyperlink; conversion means (2) for retrieving and converting a desired hypertext page; and a telecommunication network (3), from which the hypertext page is retrieved, characterised in that 20 the system comprises

- identification means (2) for identifying the hyperlinks of the hypertext page to be transmitted to the mobile station (1);

25 - storage means (2) for saving information regarding the hypertext page and the hyperlinks contained in;

30 - discriminating means (2) for transmitting the hyperlinks and the rest of the contents of the hypertext page to the mobile station (1) separately from each other.

9. System as defined in claim 8, characterised in that the system comprises transmission means (2) for transmitting to the mobile station (1)

35 - the hyperlinks as a form comprising descriptions of the links and link-specific identification data; and

- the rest of the contents of the hypertext page in the form of a SMS, USSD or equivalent message.

10. System as defined in claim 8 or 9, characterised in that the system comprises 5 transmission means (1) for transmitting a selection, said transmission means being used to transmit to the conversion means (2)

- a hypertext page selection as a form comprising identification data for the hypertext page selected; and 10

- a hyperlink selection as a form comprising identification data for the hyperlink selected.

11. System as defined in any one of claims 8 - 10, characterised in that the mobile station 15 (1) comprises soft keys (1) which are used to present and/or select hyperlinks.

12. System as defined in any one of claims 8 - 11, characterised in that the form is a TTML form, WML form or a corresponding form.

20 13. System as defined in any one of claims 8 - 12, characterised in that the hypertext page is a WWW page.

25 14. System as defined in any one of claims 8 - 13, characterised in that the mobile station (1) is a digital mobile station.

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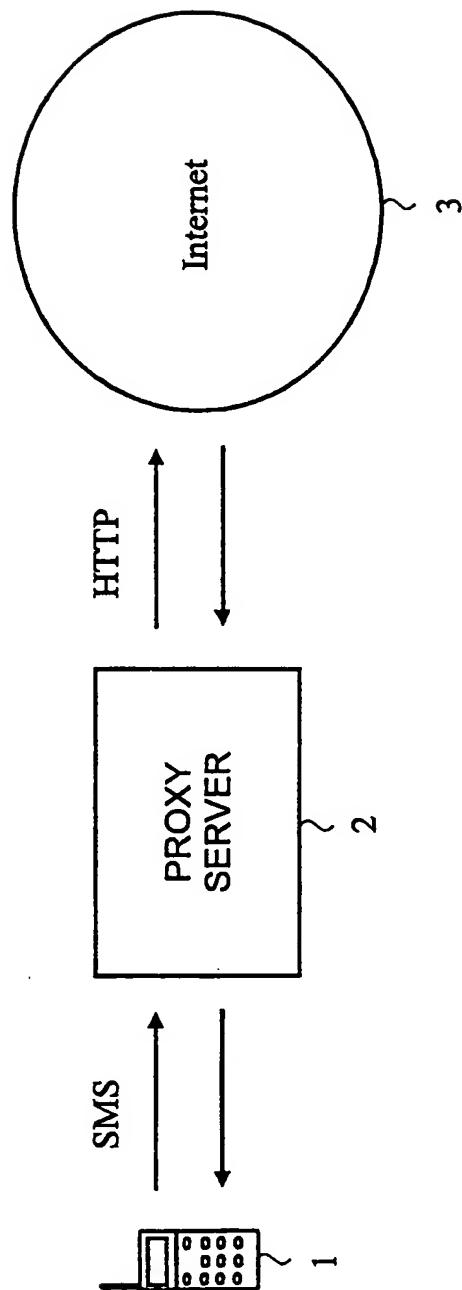
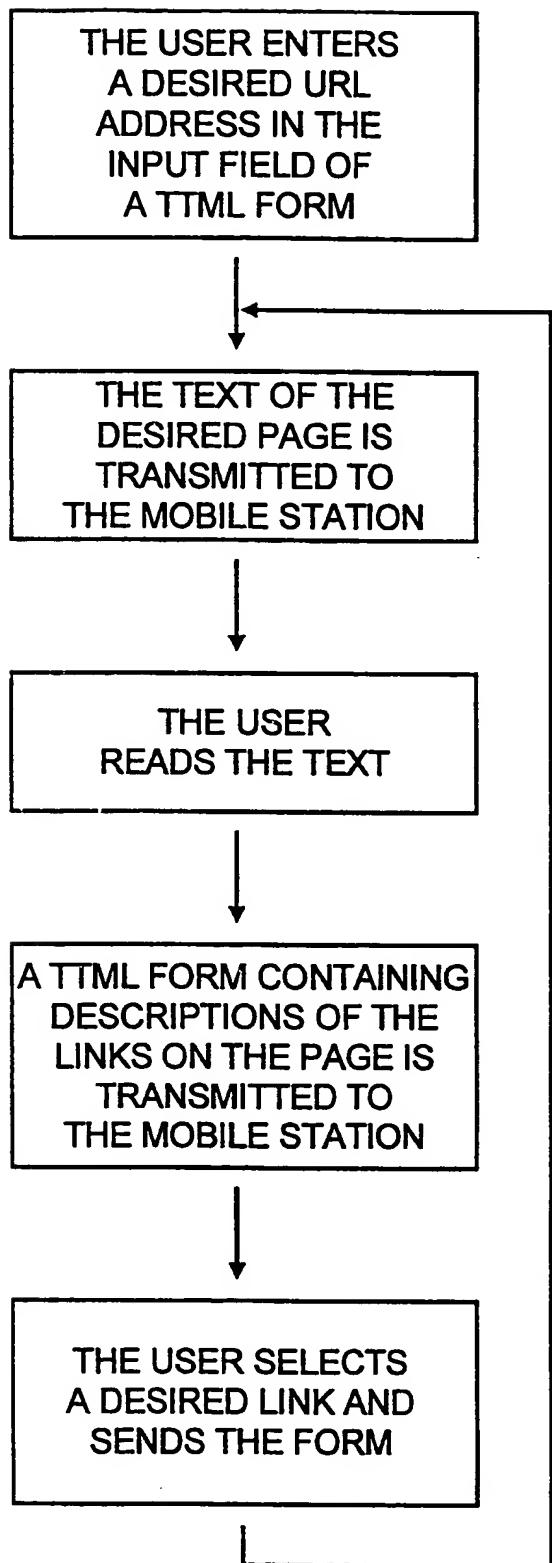


Fig. 1

Fig. 2

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